Central and Northern California Ocean Observing System
Semi-Annual Report
Period: December 31, 2006 to May 31, 2007
Questions to Heather Kerkering, heather@mbari.org or 831.775.1987

This semi-annual report for the NOAA CSC Award, NA05NOS4731123, is expected to cover the period of December 31, 2006 to May 31, 2007. The grant was awarded September 28, 2005.

1) Project Summary

Provide a brief summary (not to exceed one page) of the goals of the RA development cooperative agreement to provide context for the progress and accomplishments.

CeNCOOS just began the 3rd year of a three year (FY06-08) "coordination" grant awarded by NOAA Coastal Services Center and administered by the Monterey Bay Aquarium Research Institute.

The awarded grant funds CeNCOOS to expand and continue regional coordination of ocean observing activities in central and northern California as part of IOOS, including the following:

1. Continue to expand CeNCOOS and coordinate outreach and education by:
    a. Coordinated outreach strategy through End User Committee
        i. Identify stakeholders that can aid in developing products
    b. Coordinate and host user meetings for over 75 existing efforts
2. Develop data products based on data from existing ocean observing programs
    a. Develop a CeNCOOS product development team
    b. Work towards a "State of the Region" real-time product on the website
3. Continue to work with Ocean.US, NFRA and neighboring RAs.
4. Identify, promote and coordinate pilot projects, working closely with COTS-funded projects, CIMT and CICORE
5. Continue to develop the CeNCOOS geodatabase of activities with SIMoN
6. Coordinate communication between users and providers, researchers and committees
    a. Monthly updates and sharing of meeting minutes
7. Implement a governance structure and business plan
    a. Signed MOA and established council
    b. Draft Business Plan
8. Develop standard CeNCOOS public relations materials (brochure, posters and fact sheets).
9. Continue to provide maintenance and development on the CeNCOOS website
10. Manage data sets associating with existing ocean observing activities.
11. Continue to provide leadership to DMAC

With this grant, CeNCOOS focuses mainly on leveraging and coordinating existing efforts, integrating data and developing demonstration products, facilitating pilot projects,

creating a data portal and web site, creating a metadata catalog, and developing as a regional association with a strong governance structure and business plan.

The majority of this award supports staff, data integration and product development efforts, and a local ocean observing program (FY06 only), the Center for Integrated Marine Technologies (CIMT). FY07 funding included: coordinator and ¾ time oceanographer, travel costs, outside services (legal advice, public relations materials, web development, etc.), administrative assistance and supplies. FY08 funds will cover coordinator time, the hiring of an Executive Director, product development and outreach materials.

This document includes information pertaining only to the past twelve months.

2) Progress and Accomplishments – RA Organizational Structure

In the last twelve months, CeNCOOS staff and Council members have worked to design and finalize organizational bylaws and the Memorandum of Agreement (MOA) under which we operate. The June 2006 Council meeting included a review and discussion of the governance structure, MOA and bylaw design, development of performance measures and progress and tasks toward the business plan. The October Council meeting focused on the development of leadership and governance within CeNCOOS. Items reviewed included Council involvement, CeNCOOS short and long-term vision statement, potential staffing options based on the budget, assessment of regional and state resources for growing CeNCOOS, election process, engagement of related ocean observing organizations in the region, and the growth of our website. The Coordinator and Executive Committee work to complete these tasks outside of the Council meetings on regular conference calls and emails. Recently, the MOA was amended to improve the nomination and election process for new Council members while maintaining strength and diversity in geography and expertise. An election committee was recently established with the purpose of overseeing and running a fair election.

Still in the developmental stages, the governance, structure, and focus of CeNCOOS are influenced by the high diversity of ocean issues within our region. CeNCOOS includes over sixty partners providing data and information related to these ocean issues as well as developmental guidance. Of these fifty-five partners, 36 are signatories of the CeNCOOS MOA. In December 2005, the Signatories elected a 14-member Governing Council consisting of government agency, industry, academia, research, and non-profit representatives. A five-member Executive Committee was created from within the Governing Council. In addition, three Council members serve as Chairs for our newly formed Working Groups. Following our extensive end user needs research, CeNCOOS chose to focus on three common themes: 1) Marine Populations and Interannual Variability; 2) Water Quality and Public Health and 3) Marine Operations. It is the responsibility of the Chair to identify pilot projects and group members as well as initiate product development within their Working Group.

CeNCOOS continues to increase membership through outreach and stakeholder engagement. These efforts are well documented throughout this report. Any organization, institution, individual or business using or providing oceanographic data is welcome to become a partner of CeNCOOS. These partners are invited to formally join and support CeNCOOS by signing the MOA, becoming a "Party" or "Signatory" to CeNCOOS. Parties are entitled to nominate and vote for the Council, as well as sit on the Council. CeNCOOS and the oceanObs team also encourage each Partner to contribute information and metadata to populate the regional ocean observing inventory.

A number of changes were made in the CeNCOOS staff and Council within the past year. In mid-2006, the Governing Council hired Paul Siri as a short-term consultant to research governance options for CeNCOOS. He has assisted in developing a long-term vision, based on a mission with logical and attainable objectives. As part of the process, Paul has been interviewing institution directors and others to inquire how they see CeNCOOS becoming a center of ocean observing expertise, useful to all members and serving as a magnet for developing infrastructure, technology and products. He is also obtaining views on governing and staff structures that will maximize the likelihood that CeNCOOS will achieve its goals. Paul's additional tasks include improving coordination among agencies and identifying potential partnerships, identifying end users to help working groups, improve collaboration between IOOS and Pacific Ocean Observing Systems, and representing CeNCOOS at conferences and NFRA. Paul's research and the feedback he receives will help guide the conceptual design and development of the business plan.

Additional staff changes include the termination of Dale Robinson in December 2006 as the oceanographer, website and data manager for CeNCOOS through subaward allotted to San Francisco State University. The award for the past twelve months did not include additional funds for the Center for Integrated Technology (CIMT – FY06 only). However, the CIMT requested and received a no-cost extension into FY07 and CeNCOOS continues to support a part-time oceanObs staff, Tom Wadsworth, through UC Santa Cruz. A decision was recently made to continue this position through the remainder of the grant, mid-2008.

A new 15-member Council was elected by the MOA Signatories in January 2007. The Council members represent the entire CeNCOOS geographical region and a variety of disciplines, from non-profit leaders to scientists and government employees. The first meeting of the new Governing Council was held March 2, 2007. CeNCOOS focused efforts on preparing for an uncertain financial future by aligning our priorities with the state of California and those expressed by NOAA IOOS. The meeting included a review of each proposal submitted to the NOAA RFP released in January. CeNCOOS submitted 10 letters of intent; 4 were asked to be written to a full proposal. The Council agreed to begin a search for an Executive Director position. An interim Executive Committee was formed and subcommittee to begin drafting and Executive Summary for a CeNCOOS Strategic Plan. After much discussion and debate, the Council approved continuation of the oceanObs database manager position through the UC Santa Cruz subaward, development of fact sheets as outreach materials, and support for FNMOC to work with NRL for the continuation and expansion of the real-time wind COAMPS model.

Decisions were also made to engage more industry partners and explore alternative operational structures, such as becoming a non-profit organization.

Our decision to align priorities with NOAA IOOS and the State of California is based on recent developments in both of these organizations. Zdenka Willis, Director of NOAA IOOS, and her IOOS team visited California and members of CeNCOOS. CeNCOOS was made aware of the NOAA IOOS 5-4-12 plan which included prioritization of oceanographic parameters collected and identified specific themes. In California, the Ocean Protection Council recently announced a 5-year strategic plan for improving ecosystem health throughout the entire state. CeNCOOS and SCCOOS are working closely with the OPC to implement many of their goals, avoid redundant projects and prove the value to IOOS to the state.

Progress and Accomplishments - Planning and Implementation

A. CeNCOOS shares a Resources Legacy Foundation grant with SCCOOS to develop a business plan representing the collaboration between regional associations in the state of California. Heather Kerkering and Stephanie Peck have met a number of times to discuss the progression of the business plans, draft outlines and text, and share information pertinent to both Regional Associations. CeNCOOS staff and Council have also created an end user survey for ocean observing needs, drafted and come close to passing organizational bylaws, discussed and supported a short-term vision for CeNCOOS, increased stakeholder engagement and participation, increased the number of MOA Signatories, greatly enhanced the oceanObs geodatabase and identified additional partners for contribution to oceanObs, developed a Live Access Server from regional partner data, identified and began work on a number of pilot projects associated with the Working Groups, and created a real-time and forecasting demonstration project using surface current information, satellite imagery and winds. CeNCOOS is also working to become the data portal for the region by identifying and contacting potential technology and equipment hosts.

In the past six months, CeNCOOS staff have worked directly with SCCOOS staff to expand the business plan. Efforts are being made to synthesize extensive end user survey results and translate them into identifiable products and applications. This survey has proven critical to guiding CeNCOOS priorities and also serves as a model for other regional associations in regards to successfully identifying end user needs. Specifically, CeNCOOS has prioritized product development for water quality and public health managers due to recent events along the central California coast and continued engagement with CIMT, the State Water Board, and numerous health and wildlife specialist.

The NOAA RFP release in January allowed for the creation of a larger Regional Coastal Ocean Observing System proposal. Over 20 organizations collaborated to create a proposal focused on the water quality and ecosystem health of ‘CeNCOOS Bays:’ San Francisco, Monterey, Morro, Humboldt, and Bodega. In creating this proposal, CeNCOOS was able to identify what already exists and pull stakeholders and partners

together to really create a conceptual design for our Bays. In addition to the RCOOS proposal, CeNCOOS worked with numerous organizations to design proposals related to: animals as ocean sensors, larval dispersal for MPA management, creating a data network node, and continuing development of the ocean observing inventory.

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CeNCOOS has accomplished much over the past twelve months with regards to defining regional observing system priorities, making progress toward development of observing systems, and toward regional data management. Many of our efforts were showcased in collaborative projects and conferences, allowing for increased and improved partner sharing. These opportunities also influenced the short and long term direction of CeNCOOS, from governance to data management and outreach.

CeNCOOS has organized activities around three priority areas, in which new observations can yield new products and identifiable socio-economic benefits in our region. Initial discussion and activities are directed at identifying pilot projects, developing collaborations, and sketching out demands and budgets for observations, analysis, modeling, data management and product development. These working groups map well onto IOOS priorities and ongoing activities under COCMP, CIMT and CICORE. Results to-date have been mixed and formal establishment of working groups has not yet been completed. New participants are welcome to join these working groups.

- ***Marine Populations.*** With a focus on living marine resources, including fisheries and conservation, this working group is targeting the identification of critical species as indicators of the state of Central California Current Ecosystem. A draft document has been prepared on the State of the Central California Current Ecosystem with the Monterey Bay Aquarium Research Institute.
  CeNCOOS is participating and leading numerous efforts related to this working group. For example, the State of the Central California Current Ecosystem report has helped guide CeNCOOS participation in the following efforts:
    - Developing a "State of the Bay" report card for Monterey Bay with the Monterey Bay Crescent Ocean Research Consortium and FNMOC.
    - Serving on the planning Committee for the California Current Ecosystem-Based Management Conference along with UC Santa Cruz and COMPASS.
    - Serving on the planning committee for the Coastal States Organization/CeNCOOS/SCCOOS manager workshop in September.
    - Creating an "Environmental Prediction" animation for the website regarding the linkages between large-scale oceanographic processes and nearshore, biological conditions.
- ***Water Quality.*** Targeting both public health and ecosystem health issues, this working group is approaching water quality issues both via inflow to the coastal ocean from specific sources (e.g., San Francisco Bay) and via focus on specific issues (e.g., harmful algal blooms). Work to-date has included research proposals and also the initial plans for integrating water quality and coastal circulation data in the study and monitoring of harmful algal blooms. CeNCOOS is working closely

with CIMT and CICORE to develop an application for addressing and understanding water quality and coastal management.
CeNCOOS is participating in a number of efforts related to this particular working group. With the recent HAB events along the CA coast, CeNCOOS worked with partners to develop a press release and materials/models to inform the public and to better understand the causes, movement, and impacts of these events.

- Press release regarding recent HAB and ocean observing technologies that aid in understanding the events, sources, impacts, and linkages to human and wildlife health.
- RCOOS proposal to NOAA for improving water quality monitoring and tracking in all CeNCOOS Bays, specifically San Francisco Bay. This proposal included input and participation from approximately 20 partners.
- Collaborating with numerous water quality experts throughout the state in the planning for the CSO workshop to be hosted this fall in San Francisco.

- ***Marine Operations.*** The NOAA- coordinated Safe Seas 2006 oil-spill exercise in June was served by real-time surface-current mapping, based on the CeNCOOS HF radar array that now streatches from south of Monterey Bay (Pt Sur) to north of Bodega Bay (Stewarts Pt). This demonstrated CeNCOOS capabilities to a large number of governmental marine response agencies.
    - Safe Seas 06
    - CeNCOOS is working with PG&E as they explore the option of alternative wave energy off the coast of northern California.

Funding from the State of California has been more directed, supporting two consortiums of institutions with $21M to establish a statewide high-frequency (HF) radar array to monitor coastal surface currents, known as the Coastal Oceans Currents Monitoring Program (COCMP). The consortium in northern and central California works closely with CeNCOOS and sees itself as part of the CeNCOOS regional association. The state's contribution showcased COCMP and CeNCOOS at the Safe Seas 06 exercise and has allowed for the improved development of the website and data integration projects for the region. For example, the HF Radar technologies, in addition to existing CeNCOOS assets within the Marine Operations Working Group, were successfully integrated into surface current trajectory models for NOAA's Safe Seas 06 oil spill drill in San Francisco, California. For the largest oil spill drill in California history from August 7-11th, CeNCOOS provided NOAA HAZMAT and Sanctuary scientists with on-site field teams, historical and real-time biological and physical data, GIS layers for ecological monitoring and decision-making, GPS-equipped surface drifters, and HF radar technologies. An example of a successful collaborative effort, CeNCOOS worked closely with over a dozen organizations including NOAA, US Coast Guard, CA Office of Spill Prevention and Response, CA Department of Fish and Game, and local research institutions, rescue teams, and the media. Our single greatest contribution was the ability to accurately provide real-time and near real-time surface current models. Working under severe time constraints, the COCMP program was able to complete the installation of six HF radar sites used in the drill as well as create an avenue for accurate, near real-

time data streams. The technology, efforts, and applications were very well-received by the scientific community! http://www.cencoos.org/currents/ocean_currents.htm CeNCOOS and SCCOOS collaborated in a more recent effort to provide similar products for displaying HF Radar statewide. http://www.cencoos.org/hfrnet/

Significant efforts have also been made to move the Water Quality Working Group forward, specifically with the two Federal IOOS-related programs within CeNCOOS that have been funded on an annual basis by NOAA through Congressional earmarks: CIMT (Center for Integrated Marine Technologies) and CICORE (Center for Integrative Coastal Observation, Research, and Education). CIMT, CICORE and CeNCOOS met with the overall goal to discuss the ways in which the CICORE and CIMT programs differ yet complement each other and to explore ways in which both programs can be leveraged to provide value-added products under the CeNCOOS label. Focus became a water quality product that could include resources such as: all CICORE water sampling sites, addition of local water quality groups such as Surfrider Foundation, city and county environmental health agencies, Heal the Bay, and wastewater discharges. The organizations discussed funding levels and options – and made plans in congruence with NOAA protocols for data management and display. We also plan to link this information bathymetric data available in the region. CeNCOOS can leverage resources from CIMT and CICORE and plans to provide a web programmer to make historical, real-time and predictive models available to users.

In the past six months, CeNCOOS has responded to a variety of water quality projects and inquiries. We helped create and edit a press release demonstrating the value of ocean observing to strong HABs occurring throughout the entire state of California. We proposed a RCOOS with the goal to improve and sustain the health of the bay and coastal waters in northern and central California by improving data collection, integration and product development related to water quality parameters. Additionally, the Coordinator is working extensively with water quality experts around the state to develop an inventory of water quality programs in Monterey Bay region and to identify case studies for the CSO/NFRA/CeNCOOS/SCCOOS workshop: The Value of Ocean Observing: Applications for MPAs and Water Quality" to be hosted in fall 2007. Partners engaged in the effort include Regional Water Boards, MBNMS staff, CCLEAN, County Health Services, CA DFG, NOAA NERRs, CIMT and UCSC. CeNCOOS is also on the National Water Quality Monitoring Network Team as SF Bay was selected as one of three Pilot Projects. We are coordinating efforts in sync with IOOS.

In addition, CeNCOOS works closely with other internal NOAA program receiving IOOS-related funds, including the National Marine Sanctuary headquarters (*Safe Seas 2006* oil spill exercise), Monterey Bay National Marine Sanctuary (MBNMS: oceanobs, success stores/fact sheets), Pacific Fisheries Environmental Laboratory (PFEL: LAS and Demonstration Project) and National Marine Fisheries Service (for the Pacific Coastal Ocean Observing System, PaCOOS).

In terms of aiding the development of observing system priorities, CeNCOOS played a large role in providing information to Raytheon as well as access to people/data

associated with Regional Association development. CeNCOOS hosted two workshops at MBARI for the Raytheon team.

CeNCOOS also aids in designing the observing systems by participating in monthly NFRA conference calls and attending various meetings and conferences related to IOOS, the Regional Associations, and ocean observing in general. Heather Kerkering, Paul Siri, and Rondi Robison (CIMT) and others from the region have participated in a number of planning meetings for IOOS and the National Federation of Regional Associations (NFRA). Three representatives from CeNCOOS attended the Remote Sensing Workshop in Woods Hole, with one of the representatives, Dave Foley, serving on the Steering Committee. Josh Pederson and John Graybeal (MMI-MBARI) also attended the Sensor Catalog Workshop for CeNCOOS, with regards to metadata management and inventories. Heather Kerkering and Council members Francisco Chavez and Churchill Grimes also serve to improve development and prioritization by participation on the PaCOOS Board of Governors, meeting regularly for conference calls and in-person meetings. Heather Kerkering and Rondi Robison also provided responses to the CSC Needs Assessment and follow-up. Heather has also worked with MBARI to improve the content and access to the CeNCOOS website, especially in an effort to highlight CeNCOOS, the AOSN Monterey Bay 2006 project, and the Fort Macon project. Additional efforts to identify priorities in the region include website as it was designed to highlight existing efforts, data, and projects in the region to the average end user.

The CeNCOOS observing system is developed in collaboration with Pacific Ocean partners, including PacIOOS, AOOS, NANOOS, SCCOOS and PaCOOS. CeNCOOS attended and participated in a recent PaCOOS workshop that led to a few action items geared toward better understanding RA relationships to PaCOOS and toward developing a large Pacific-wide model that links large oceanographic patters to nearshore and local events. CeNCOOS is also on the planning committee for the California Current Ecosystem Based Management Conference scheduled for January 2008. This planning committee consists of UCSC and COMPASS. The conference involves development and collaboration with Science and Steering Committees for the workshop from around the entire west coast. San Francisco Bay was also recently selected as one of the Pilot Projects for the National Water Quality Monitoring Network (NWQMN). CeNCOOS is participating in this effort and serving as a representative to IOOS as we link these two programs together. CeNCOOS also worked with the Humboldt Bay Harbor Recreation and Conservation District to host a meeting in Humboldt with representatives from HSU, SeaGrant, NOAA NWS, USCG, SF Marine Exchange, and many others. Recent Council meetings have encouraged forward movement in the development of a conceptual design, Executive Summary and business plan.

CeNCOOS continues to identify and collaborate with partners throughout the state for the benefit of improving our program as well as highlight the importance of an ocean observing system for both the region an the nation. This fall, we worked closely with SCCOOS in preparation for the California and World Ocean's Conference (CWO). CWO was filled with CeNCOOS and SCCOOS-related presentations. In addition, CeNCOOS and SCCOOS built an extraordinary exhibit to highlight our purpose and

collaborative efforts. CeNCOOS greatly improved our website, oceanObs and the Live Access Server and Demonstration Project for the conference. All was well-received and a number of positive relationships and partnerships developed from this effort!

A more recent event, the Monterey Bay National Marine Sanctuary Symposium (March 2007), provided CeNCOOS an opportunity to showcase our program to a large audience, from the public to teachers, scientists and government groups. CeNCOOS emceed the Symposium titled, "Observing Systems for Ocean Health." CeNCOOS Council members served as presenters and speakers, CeNCOOS worked with CICORE, CIMT and CSUMB to create an exciting, interactive exhibit, and we worked with many local partners on the poster session.

Heather has represented and discussed the value and efforts of IOOS at numerous events, including the Regional Ocean Governance workshop in Monterey, CA; all Ocean Protection Council meetings; NOAA/NMFS workshop; NOAA CSO Managers Workshop; and the Humboldt workshop.

D. CeNCOOS is working with local partners to develop both an ocean observing inventory and a data integration demonstration project. At the recent IOOS Regional Catalog Workshop Planning, the CeNCOOS information management and data discovery tool, oceanObs (www.oceanobs.org), was highlighted as one of the two major systems in the nation that could develop an inventory of observing assets that provide data in near real-time as well as a queryable map of existing assets. It was suggested that oceanObs serve as one possible aggregator of West Coast observing information that would then feed into a national repository. The oceanObs team is currently working to populate the database, expand to other IOOS programs, and meet the established technical requirements.

CeNCOOS Partners contributed significantly to the national effort to populate the National IOOS Registry. Ocean Obs served as a model for the development of the nationwide inventory. CeNCOOS held a conference call of our partners distributing real-time data and assisted them in completing the appropriate forms at the request of NOAA.

CeNCOOS released the first data integration project at the California and World Ocean conference in September. The core of the system is a LAS that incorporates near real time and historical data streams from over 10 organizations. The first demonstration integrates satellite imagery with surface currents. This will include a display of near real-time currents and the ability to perform data manipulation including animation sequences, extraction of time series, and the interactive capacity to travel the path of a virtual drifter. The project was designed and built in compliance with IOOS DMAC recommendations for data transport and browsing. CeNCOOS hopes to expand the demonstration project to meet more end user requests and the needs identified by each Working Group. The second outcome from this effort will most likely focus on displaying water quality conditions for the benefit of public health (described above).

CeNCOOS also hosted a 'Data Meeting' for the region to discuss resources and options for integration and product development. Organizations represented include: Monterey Bay Aquarium Research Institute (MBARI), Partnership for Interdisciplinary Studies of Coastal Ocean (PISCO), Tagging of Pacific Pelagics (TOPP), NOAA Environmental Research Division (ERD), CICORE, Naval Postgraduate School (NPS), and the Alliance for Coastal Technologies (ACT). This meeting was meant as a nuts and bolts discussion for Data Management in the CeNCOOS region – a stepping stone to improve collaboration and eliminate areas of overlap and redundancy. Although many groups were identified as important participants, it was certainly not exhaustive and there are plans to expand outside of the Monterey region, incorporate additional groups, and identify further those who might benefit from these data efforts.

OceanObs, the ocean observing inventory for CeNCOOS, has greatly improved over the past year. In August 2005, all CeNOOS partners were invited to participate in OceanObs. A number of partners contributed their metadata to the program. Although initial response was slow, oceanObs was well received in IOOS and has been highlighted at a number of conferences and meetings. OceanObs staff include Josh Pederson of MBNMS SIMoN program and Tom Wadsworth, a part-time UCSC staff working under a CeNCOOS subaward. Tom attended CWO to introduce and highlight oceanObs. Josh attended the Sensor Catalog Workshop in Woods Hole for data managers. While Tom is engaging partners and growing the database, Josh is developing a google-based metadata queriable inventory for the region. The CeNCOOS and oceanObs team meet twice a month to provide updates and agree on methods for moving forward.

To date, the oceanObs database consists of over 40 partners, 300 data products, and 900 sampling sites. OceanObs is our greatest project to date! It is interactive and serves as a valuable tool to many end users. CeNCOOS is able to direct people to this site for their inquiries. CeNCOOS continues to engage organizations and institutions to contribute their data to the system. The request to build such a database is one heard often and at numerous conferences and meetings. CeNCOOS travels to workshops and conferences to demonstrate the value of the effort.

The Live Access Server and Demonstration project also highlight our progress toward regional data management. The LAS provides access to real-time data from a variety of Partners. Created with funds from the NOAA grant and in collaboration with the Environmental Research Division and Coastwatch, we've successfully created a data integration project demonstrating machine – to – machine interoperability that fulfills IOOS data management and connectivity protocols and allows data to be downloaded. You can search by variable, time scale, region and organization to receive actual data, graphs, and images from the contributing partners. We are looking forward to expanding this effort to include more CeNCOOS data collectors.

The Demo project includes HF Radar surface current modeling in 1, 25 and 33hr radial measurements from Monterey north to SF Bay, satellite imagery demonstrating *Chl a* concentrations and/or SST, and moorings. Users can also place a drifter at a specific

location and receive a forecast animation of its movement. This product is still under development and in need of user feedback (*in progress*).

Finally, SCCOOS is hosting a google-based COCMP model for the CeNCOOS website. This demonstrates a clear united California Regional Association front using the state's contribution of HF Radar and surface current measurements.

CeNCOOS continues to build and develop data products in accordance with IOOS DMAC and MMI guidelines. CeNCOOS proposed a "regional network node" to the NOAA RFP released in January which included promised and anticipated participation from 10 organizations region-wide. These organizations planned to develop standards and devote at least one month of data time to building the system and creating a true, operating CeNCOOS network node. CeNCOOS is also considering funding an effort with NRL and FNMOC to continue the COAMPS real-time wind model for the entire region.

Stakeholder Engagement

Workshops held:
Safe Seas 06: pre and post workshops, including the exercise itself
"Data Train" Workshop
CIMT and CICORE meetings (August and November)
Council Meetings (December 2006; March 2007; June 2007) - public welcome to attend
Humboldt Workshop: March 2007
PaCOOS Meeting: Seattle, WA May 2007

Additionally, CeNCOOS and SCCOOS will implement the recently received Coastal States Organization award to host a workshop for coastal zone managers in California this fall. The workshop is titled, "The Value of Ocean Observing: Applications to MPAs and Water Quality."

Other planned workshops and opportunities for stakeholder engagement:

- June 2007 Council meeting
- Coastal Zone 07
- Ocean Energy Conference August 07
- CSO/NFRA Workshop: September 07
- California Current EBM : 2008

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New Partnerships:

CeNCOOS has developed a number of new partnerships as a result of attending conferences, extensive outreach efforts, and in the process of developing workshops and conferences.

Heather Kerkering and Paul Siri of CeNCOOS were authors on an accepted proposal to host and California Current Ecosystem Based Management Conference. CeNCOOS will work with UCSC and COMPASS (Communication Partnership for Science and the Sea) to host a 2007 conference on ecosystem based management. The conference will be supported by the Moore and Packard Foundations and intended to frame science and management questions for the California Current System Large Marine Ecosystem (CCLME). This CCLME focus extends along the entire west coast.

CeNCOOS and SCCOOS are working closely with the recently developed Ocean Science Application wing of the state's Ocean Protection Council, assuring strong collaboration between efforts and goals.

CeNCOOS staff continues to engage partners and stakeholders in the CeNCOOS region through a variety of methods. Paul Siri, Rondi Robison, and Heather Kerkering, the oceanObs team, the Product Development team and members of the Council are working hard to engage partners. Paul Siri has put forth an admirable effort to engage potential partners. We have successfully met with and gained support from the following organizations:

Water Quality Control Boards through the entire CeNCOOS region
Bay Conservation and Development Commission (BCDC)
Centers for Ocean Sciences Education Excellence (COSEE)
California Academy of Sciences
SAIC
Marine Advanced Technology Education
Surfline
Surfrider Foundation
Heal the Bay
Port of Oakland
Monterey and Santa Cruz County Environmental Health Boards
Sonoma County Water Agency
USGS
Ocean Protection Council and Ocean Sciences Application
Pacific Ocean Shelf Tracking Project – Acoustic Tagging
PG&E

Parties to CeNCOOS include:
CSU Monterey Bay
San Francisco State University
UC Davis
UC Santa Cruz
Moss Landing Marine Labs

Western Regional Climate Center
Hopkins Marine Lab/Stanford
Humboldt State University
CSU East Bay
California Polytechnic State University
Alliance for Coastal Technologies
Tagging of Pacific Pelagics
National Estuarine Research Reserve (San Francisco and Elkhorn Slough)
CODAR Ocean Sensors
ESRI
Point Reyes National Seashore
Fleet Numerical
Naval Postgraduate School
California Fish and Game
Coastal Conservancy
Sonoma County Water Agency
SF Estuary Project
Humboldt Bay Harbor, Recreation and Conservation Districe
Central Coast Long-term Environmental Assessment Network (CCLEAN)
Point Reyes Bird Observatory
SF Marine Exchange
Commonweal
Monterey Bay Aquarium Research Institute
Pacific Coast Federation of Fishermen's Association
National Resources Defense Council
Humboldt Bay Stewards
Western Association of Marine Laboratories
CoastKeeper
PG&E

Contributors to OceanObs include:
ACT
BOON – UC Davis
CDFG
CalCOFI
CalEnvironmental Digital Library Network
California Environmental Resource Evaluation System
CA Sea Otter Surveys
CIMT
Central Coast Long-term Environmental Assessment Network
Center for Integrative Coastal Observation, Research and Education
Central Coast Regional Water Quality Control Board
Cordell Bank National Marine Sanctuary
Coastal Data Information Program

Coastwatch
Elkhorn Slough NERR
Humboldt Bay Harbor, Recreation and Conservation District
Innovate Coastal-Ocean Observing Network (ICON)
Land/Ocean Biogeochemical Observatory in Elkhorn slough
MBARI
NDBC
NMSP West Coast Observatories
NWLON
NWS
Network of Environmental Observations of the Coastal Ocean
Pacific Coast Federation of Fishermans' Association
Partnership for Interdisciplinary Studies of Coastal Oceans
Physical Oceanographic Real-Time Systems
Pioneer Seamount Acoustic Observatory
Point Lobos Ecological Reserve Sea Otter Monitoring
Rapid Environmental Assessment Laboratory
Regional Water Quality Control Boards
San Francisco Ecological Institute
SF NERR
SF Public Utlities Commission
SIMoN
State Water Boards
Surfrider Foundation
TOPP
USGS

Paul Siri, Heather Kerkering and Francisco have also met with Marcia McNutt, the CEO of MBARI, to discuss hosting the CeNCOOS grant. CeNCOOS is also participating extensively with the state effort to develop a 3D Model of SF Bay and of Monterey Bay. Additionally, CeNCOOS and SCCOOS are working with NFRA, the state of California, water boards, and USGS, to host a coastal zone managers' workshop, with funds from the Coastal States Organization.

Heather has also met with the following groups (new and recent) to encourage data sharing, participation and product development:

USGS
Center for the Future of the Oceans/Monterey Bay Aquarium
Tagging of Pacific Pelagics
Marine Advanced Technology Education
COSEE
National Estuarine Research Reserve
BCDC
The Nature Conservancy

National Marine Fisheries Service
State Water Resources Board and Environmental Health Divisions
Pacific Ocean Shelf Tracking Project – Acoustic Tagging
NERR
All Water Board Groups

Additionally, the Safe Seas 06 exercise provided an opportunity to work with the following:
Sanctuaries
Coast Guard
OSPR, DFG
NOAA Hazmat
Presidio and Parks
Bodega Marine Lab
Golden Gate National Recreation Area
BLM/DOI

The MBNMS Symposium for Ocean Observing encouraged and highlighted partnerships between CeNCOOS and:
CIMT
CICORE
CSUMB – Seafloor Mapping
TOPP
UCSC
MBARI
Local Teachers
NOAA NMFS
MLML
NPS

Heather Kerkering also participated as an IOOS representative to the NMFS Fisheries/IOOS workshop in Santa Cruz, CA. The focus of the workshop was to integrate and share information to promote ocean observing at the Congressional level.

CeNCOOS is also an advocate of the "Thank You Oceans" campaign. This effort allowed for a connection with staff and exhibit teams from Aquariums throughout California as well as each National Marine Sanctuary Visitor Center.

Website
The website is only six months old. The redesigned website was a huge effort which included much time and input from Dale Robinson, Paul Siri, Rondi Robison, Heather Kerkering and Natasha. Heather Kerkering and Dale Robinson met and talked often to design the website in time for CWO. Others provided outside perspectives and user feedback. The ultimate goal is that the website will serve as the data portal to the region

while being as user-friendly as possible. The site provides basic information about CeNCOOS, IOOS and ocean observing, as well as access to program web pages, real data, current coastal conditions, legislative and developmental documents, oceanObs, the Live Access Server, the Demonstration project, and an event calendar. We continuously update the site and receive input from organizations and end users on how to improve access to information and user friendliness. We are often approached by local organizations and attempt to meet request to host models and applications on our website. We developed a demonstration project that provides access to a SCCOOS-developed google map demonstrating state surface current mapping. CeNCOOS also plans to add more education links and make the website more user-friendly for all end-user perspectives.

Education and Outreach
CeNCOOS needs to work further on developing the educational component of ocean observing. The following efforts have enhanced our educational goals:

- Flyers and brochures distributed at conferences and local events
- The California and World Oceans conference and exhibit
- Meetings with NERR, MBARI and EARTH, MATE, and COSEE
- Working with the MBARI intern to develop the "State of Central California" report
- Creation of fact sheets and success story reports
- New Brochure

CeNCOOS plans to develop an Education Committee for planning the 2008 teacher workshops with MBARI EARTH to highlight Ocean Observing Systems.

3) Scope of Work

Outline the priorities for the next funding period and describe any current or anticipated changes to the statement of work or in meeting objectives (due to problems encountered, involved approach, etc). red = completed

Priorities for the next funding period include (in no particular order):

- Hiring of an Executive Director and/or a Data Programmer for the remainder of the grant term (almost complete)
- Establishment of a new Council (5 new members for a total of 15)
- Location an place/individual to host machines and personnel for the CeNCOOS data portal project (possibly FNMOC for COAMPS)
- Expansion of the Live Access Server, the Demonstration Project, and the Water Quality pilot project. (upcoming for CSO/NFRA Manager Workshop)
- The Coastal States Organization sponsored coastal zone manager workshop in California. The event is scheduled for September 2007.
- 3D Modeling effort for San Francisco Bay – to be held in January 2007
- Aid in the review of COCMP –January 2007
- Aiding with state projects: desalination, levees, habitat mapping, and ocean observing
- Improving and supporting the MBNMS SIMoN partnership to develop oceanObs

- The Monterey Bay Sanctuary Symposium with the theme of Ocean Observing. Heather is the co-emcee for the event and helped organize the speaker lineup and poster sessions. The event will be held March 3, 2007.
- Identify methods for leveraging from various observing programs in the region for the data integration, product development, and outreach. This includes leveraging USGS funds to host a coastal zone manager workshop.
- The California Current Ecosystem Based Management Conference – identifying the Steering and Science Committee as well as hiring a Program Manager. The event is set for spring 2007.
- Establishing official bylaws and a short and long term vision.
- Continuing partner engagement and demonstration of the value of ocean observing.
- Developing public relation materials for workshops, conferences and events. CeNCOOS will work with partner, CODAR Ocean Sensors, to design a new brochure, flyer and one-pager.
- Readdress priorities based on State of California and NOAA IOOS
- Create an Executive Summary to explain CeNCOOS, outline vision and goals, and aid the development of the conceptual design and business plan
- Create a template for success stories and share them online
- Work with various organizations and find funding for requested SF Bar Pilot buoy for the deep water channel
- Work with NOAA NERR Coastal Training Program to share CeNCOOS resources with additional end users

The new Council will undoubtedly influence the way CeNCOOS moves forward and prioritizes the list of items above. A continuous obstacle to reaching these goals is the uncertainty in IOOS funding. An ongoing challenge has been maintaining engagement of members building a stable support staff in the face of shifting IOOS timetables and a lack of clarity from NOAA as to how it will manage IOOS.

In contrast to the centralized structure of the Southern California Coastal Ocean Observing System (SCCOOS), which coordinates most ocean observing activities in southern California through a central hub at Scripps Institution, programs in the CeNCOOS region are managed independently. While this allows for broader participation and a more democratic approach, it makes it difficult to assemble the significant and stable support staff needed for bringing an integrated ocean observing system to fruition in central and northern California.

4) Leadership Personnel

Include any changes in key scientific or management personnel, especially that effects the scope of the work proposed.

A new Council was elected January 2007. The Council includes 5 new members for a total of 15 (3 stepped down). The new Council is guiding our priorities and development,

with a main focus on the conceptual design, executive summary, business plan, outreach and product development.

As mentioned above, the original individual hired as the oceanographer/data manager through the CeNCOOS subaward to San Francisco State University, stepped down at the end of the 2006. CeNCOOS has identified an individual to serve as the Executive Director and is working out logistics.

The newly elected Council may change the scope of work proposed and CENCOOS will notify the correct personnel. More funds than are currently allocated will most likely go towards data management and product development, salaries, public relation materials, outreach, and integration of real-time data. Administrative assistance from MBARI will aid in travel arrangements and website maintenance.

The PI and grant host are not anticipated to change.

5) Budget analysis

Brief commentary on the actual budget expenditures in related to anticipated expenditures.

A number of changes were made to the original budget, including:

- The subaward to SFSU will discontinue in 2007 until we decide how to redirect the funds or hire a new oceanographer/website/data manager
- Paul Siri was a contractor receiving $100/hr for CeNCOOS.
- The MBNMS SIMoN program will receive $10K in 2007 for additional assistance with oceanObs.
- CeNCOOS will continue Tom Wadsworth's job as the data manager and outreach staff for oceanObs, through a subaward to UCSC through mid-2008
- CeNCOOS hopes to hire a researcher to continue developing the "State of the Region" reports for all of California
- CeNCOOS plans to hire an Executive Director and/or Data Programmer
- CeNCOOS hopes to host additional workshops
- CeNCOOS plans to reallocate money for improved product development

The total funds remaining for CeNCOOS is $600K (through mid-2008). Any changes made to the actual budget expenditures outlined in the proposal will move through the appropriate NOAA formalities before any of these anticipated expenditures (listed above) take place.